

Book Review

Having Faith. An Ecologist's Journey To Motherhood

by Sandra Steingraber (Perseus Books, 2001 288 pp., ISBN 0738204676; \$26.00 hardcover}

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Phil Cousineau, in his book *The Art of Pilgrimage*, says, that “The difference between pilgrim and tourist is the intention of attention, the quality of the curiosity.” From this perspective, Sandra Steingraber’s book, *Having Faith. An Ecologist’s Journey To Motherhood*, qualifies as a pilgrimage through pregnancy, with Steingraber serving up an enjoyable blend of experience, scientific reflection, and writing that verges on the poetic.

Now a book chronicling the ten months of a pregnancy and the first year of infancy may not, admittedly, be an obvious choice for a review in a periodical aimed at chemical professionals. Certainly, I would not have expected to be interested in reviewing it. When it came across my desk (unsolicited), my initial reaction was “Here’s one that was clearly misdirected,” rather like my reaction when my wife and I are trolling the aisles of the local video store and she picks up a film whose jacket blurb describes it as “heartwarming”. For some reason, however, I glanced through the first few pages of “*Having Faith*” and was drawn into it, so here I am, recommending that you read a book which is not about chemists, or the chemical profession, but which illustrates beautifully what can happen when an artist and a scientist inhabit the same body.

Sandra Steingraber, who currently teaches at Cornell, can flat out *write*. Someone, during her scientific apprenticeship, obviously forgot to tell her about the importance of writing in the third person and/or the passive voice. The result is a style that is a kind of extended meditation on her experimental observations in the laboratory of her pregnant body.

In the very early stages of her pregnancy, during the time when, to quote Psalm 139, “when I was growing in secret in my mother’s womb”, there is not much that Steingraber can actually observe. She nonetheless imagines the changes taking place, such as the proliferation of blood vessels, in imaginative parallels between external observations as a naturalist with the processes taking place within her:

“Plant physiologists still can’t explain why maple sap runs in the spring. It’s a mystery that secretly pleases me. All trees stockpile sugar during the winter, and in most species simple capillary action can account for its ascent from roots to branches in the early spring, This is the same adhesive force that draws a drop of water through a paper napkin. But this principle cannot account for the ten to twelve gallons of 4 percent sucrose solution that your average sugar maple can pull up its trunk and pour into a bucket during the month of March. Injure any other tree and sap will merely ooze from the wound. But the complex hydraulics of maples somehow generates an interior force that exceeds the outside air pressure. Sap spurts from every gash and broken branch.” (p. 30)

“My botanical reverie soon turns obstetrical. In fact, the internal anatomy of a human placenta resembles a maple grove: the long columns of cells sent out by the embryo into the uterine lining during the first few weeks of pregnancy quickly branch and branch again until, by the third month of pregnancy, the treetops of an entire forest press up against the deepest layers of the womb. Meanwhile, the open taps of the uterus’s spiral arteries send jets of blood spurting between these arboreal structures.” (p. 31)

As the book advances along with her pregnancy, Steingraber’s attention moves beyond the confines of her body to the interactions linking the mother, the developing fetus and the environment. Along the way, she discusses the effects of teratogens such as diethylstilbestrol (DES), mercury and lead, exploring and challenging some time-honored ideas such as the notions of threshold toxicity limits and the placental barrier that supposedly protects the unborn child from exogenous contaminants (both now known to be incorrect). She provides information on the various ways in which data on birth defects is (and often is not) catalogued throughout the United States. She employs data from the *Toxics Release Inventory* to describe the release of toxins into the environment as a result of both natural processes and human activity, highlighting the ways in which government and business have often chosen to ignore data for decades. Her discussion of lead contamination ranges widely, covering

- the known toxicity of lead compounds, the introduction of organolead compounds as antiknock additives in gasolines and their continued use for decades in the face of incontrovertible evidence of lead toxicity, arguably because the alternative, ethanol, was nonpatentable, and therefore less profitable,
- the promotion of lead-based pigments by the paint industry, the consequence being that their banning in the United States trailed that in Europe by decades,

- the fact that coal-based power plants, the single greatest emitters of lead into the biosphere, were until relatively recently exempt from environmental regulations governing lead emission,

eventually connecting again with her personal story linking lead pollution in the starting point of her and her husband's journey from a leave in her home state of Illinois (one of the major US areas of combustion-based lead release) to Somerville, her husband's home city, where she and her husband then resided.

In all the back and forth movement between the intricate process taking place within her and the potential environmental assaults that could derail or terminate it, though, Steingraber's narrative; while informative thought provoking and sobering, never became hysterical. There are even laughs along the way, such as when she speaks of feeling herself isolated, in transit between two worlds:

“Being pregnant is like walking over a plank-and-cable bridge. Behind me, on one bank, is the tribe of women who are not mothers. They drink wine, stay up late, skip meals, change lovers, study Sanskrit, and write grant proposals for a five-year study of tropical cloud forests. In front of me, on the other bank, is the tribe of mothers. They arrive at meetings late, leave parties early, are badly in need of haircuts, know way too much about the care and feeding of guinea pigs, and have to hang up now.” (p. 94)

The well-established correlation between brain size and gestational period suggests that human pregnancies should last about twenty-two months. However, the size of the human pelvis makes this impossible, the result being that the first year of life can be regarded as the last twelve months of pregnancy. This provides a rationale for Steingraber's devoting the last third of her book to her first year of motherhood, and in particular to an extensive discussion of nursing and mother's milk. Steingraber provides a vivid contrast between the extensive benefits provided by mother's milk and the alarming fact that biomagnification (a process which she links to conservation of mass as one moves up the food chain) concentrates toxins in mother's milk, making it among the most contaminated of foods.

This, in a way, brings me back to where I began - to the question of why a middle-aged male chemist should be enthusiastically recommending a book on the pregnancy of an ecologist, and why I think you should consider reading it. There are, in fact, quite a few reasons, beginning with the quality and vitality of Sandra Steingraber's writing, which many scientists could benefit from imitating at some level. Next is her ability to integrate the personal and professional perspectives in a way that respects the integrity of both. Thirdly, there is simply a lot to learn about the interlocking nature of biological and

biochemical processes and the way in which they are inextricably intertwined with the world in which we live and move. Finally, because the demographic shift in the profession in recent decades makes it extremely likely that in the near future (if it has not already happened) you, or someone in your laboratory or department, will be experiencing these remarkable changes, or be married to someone experiencing them, or working with or supervising someone negotiating them, the ability to appreciate the magnitude and the majesty of what is happening could prove very useful.